

## ACKNOWLEDGEMENTS

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1903 was one of the major expeditions to these reefs. However, the expedition in Lakshadweep was confined only to the Minicoy Island, which is the southernmost island of the Lakshadweep Archipelago and nearest to Maldives. The present sighting is from Agatti Island, which is over 300 nautical miles north of Minicoy Island.

The present find extends the range of *H. sanguineus* to the west coast of India.

Size: 20 cm and 21 cm. Of the two specimens only one was collected and stored in 90% ethyl alcohol, after studying the morphological characters. The specimen is deposited in the BNHS Collections.

## REFERENCES

- APTE, D.A. (2009): Opisthobranch fauna of Lakshadweep Islands, India with 52 new records to Lakshadweep and 40 new records to India. *J. Bombay Nat. Hist. Soc.* 106(2): 162-175.
- APTE, D.A., V.J. BHAVE & D. PARASHARYA (2010): An annotated and illustrated checklist of the Opisthobranch fauna of Gulf of Kutch, Gujarat, India, with 20 new records for Gujarat and 14 new records for India. Part 1. *J. Bombay Nat. Hist. Soc.* 107(1): 14-23.
- DEBELIUS, H. (1996): Nudibranchs and Sea Snails Indo-Pacific Field Guide. IKAN - Unterwasserarchiv, Waldschulstrasse 166, 65933, Frankfurt, Germany. 321 pp.
- DOUBLE, T. (1992): Here be Giants. *BBC Wildlife* 10(5): 34-40.
- GARDINER, J.S. (1903): The fauna and geography of the Maldives and Laccadive Archipelagos. Vol. 2, Pp. 1,080. Cambridge University Press.
- RAO, K.V., P. SIVADAS & L.K. KUMARY (1974): On three rare doridiform nudibranch molluscs from Kavaratti Lagoon, Laccadive Islands. *Journal of the Marine Biological Association of India* 16(1): 113-125.
- THOMPSON, T.E. (1972): Observations on *Hexabranhus* on the Australian Great Barrier Reef (Gastropoda: Opisthobranchia). *Veliger* 15: 1-5.
- VALDES, A. (2002): How many species of *Hexabranhus* (Opisthobranchia: Dorididae) are there? *Molluscan Research* 22: 289-301.

## 17. AN AMPLIFIED DESCRIPTION OF HITHERTO LITTLE KNOWN THREATENED SPECIES, *PRIMULA GLOMERATA* PAX (PRIMULACEAE)

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### Introduction

During a field study in North Sikkim (September-October 2007), a species of *Primula* L. was collected about 10 km from Lachung towards Yumthang, at an altitude of about 3,300 m. After critical study, it was identified as *P. glomerata* Pax (identified in CAL by matching type material). Pax (1905) described this species based on J. Scully specimens (no. 287, CAL) from Nepal Himalaya. The species was reported from India as *P. crispa* by Balfer and Smith (1916) based on the collection by Smith (no. 4209, CAL!) from Ningbil in Sikkim. However, herbarium studies (CAL) revealed that the species was first discovered by T. Anderson from Dzongri in West Sikkim in 1862 before the description by Pax (1905). Subsequently, the species was described by Smith and Fletcher (1944), Gould (1982), Polunin and Stainton (1984), Richards (1993), Hu chi-ming and Kelso (1996), and Basak (2001). Foremost among others, Richards and Basak revised in detail, especially Basak (2001) described *P. glomerata* based on the

very old herbarium specimens (CAL) collected by T. Anderson (no. 830) and King's collector *s.n.* (acc. nos. 272260, 272261, 272263, 272938) from Dzongri in West Sikkim and described without a line drawing. The present paper embodies an amplified description and detailed line drawing based on live collections from North Sikkim (S. Panda 30792, CAL & Barasat Govt. College herbarium) in 2007.

The genus *Primula* L. consisting of about 430 species (Mabberley 2008) is confined to tropical Asia (mostly at high hills), Europe, Africa (Ethiopia) and South America. Among 430 species, about 106 species (Basak 2001) are reported to occur in India (Himalayas and North-eastern India: Assam, Meghalaya, Manipur and Nagaland), mostly in the Eastern Himalayas.

*Primula glomerata* Pax in Engl. Pflanzenr. 4. 237 (Ht. 22). Primulaceae: 92. 1905; W.W. Sm. and Fletcher, *Trans. Proc. Bot. Soc. Edinburgh* 34(1): 156. 1944; Weibel, *Candollea* 15: 162. 1956; Gould in Hara *et al.* (ed.), Enum.

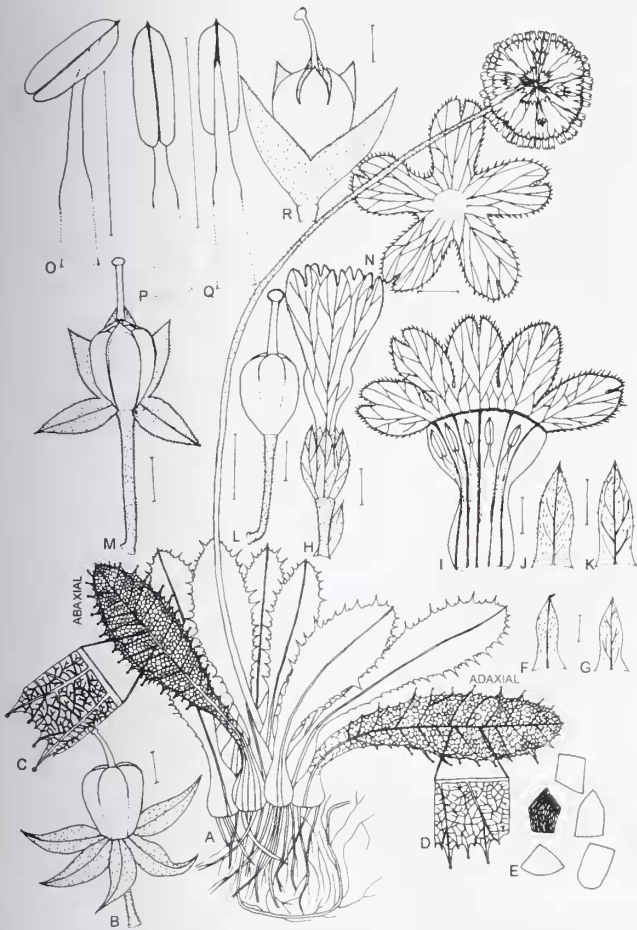


Fig. 1: *Primula glomerata* Pax: A. habit; B. mature capsule; C. abaxial leaf (part magnified); D. adaxial leaf (part magnified); E. seeds; F, G. bracts; H. flower; I. corolla split open; J, K. calyx lobes; L. ovary (without persistent calyx); M. ovary (with persistent calyx); N. corolla lobes (top view); O-Q. stamens; R. immature capsule. Scale bars: A = 2 cm; B = 1 mm; F-G, L, M, O-R = 1 mm; H-K = 2 mm; N = 3 mm (A-R: drawn from S. Panda 30792, CAL & Barasat Govt. College Herbarium). Drawn by S. Panda.

Fl. Pl. Nepal 3: 72. 1982; J. Richards, *Primula*: 260. 1993; Hu chi-ming and Kelso in Wu Zheng-yi and Raven (eds.), Fl. China 15: 180. 1996; Basak, Gen. *Primula* vol. 1: 408. 2001. Type: Nepal, no proper locality, J. Scully 287 (CAL!). *P. crispata* Balf. f. & W.W. Sm., *Notes Royal. Bot. Gard. Edinburgh* 9: 160. 1916. Type: India, Sikkim, Ningbil, 3,952 m, 11.viii.1910, W. W. Smith 4209 (CAL!). Fig. 1.

Perennial herb, 15-45 cm long; rootstock thick c. 12 mm long, bearing tuft of wiry roots, longer root c. 12 cm long. Stem rhizomatous, very short beset with rosette of leaf bases, glabrous. Leaves exstipulate, radical, 8-14 in spreading rosette, glabrous, 50-120 × 16-26 mm (incl. petioles), lamina papery, narrowly ovate-elliptic to rarely obovate-elliptic, 30-80 mm long, rounded-erose-denticulate

at apex, irregularly erose-denticulate or double denticulate at margin, long teeth gland-headed, cuneate at base, venation craspedodromous type; petioles sheath-like flattened, 20-50 mm long, glabrous, flanked with thin laminar extension. Scape solitary, slender, variable, usually 100-370 mm long, central, erect, covered with white dust-like grains throughout, mealy toward the apex, bearing a terminal globose head. Head perulate, in umbel, usually more than 20-flowered, 30-50 × 35-55 mm, covered with white dust-like grains throughout. Flowers erect, heteromorphic, annulate, bisexual, actinomorphic, pentamerous, 15-18 mm long, deep blue-mauve or intense violet in colour with dark eye at centre, little fragrant, amid of congested imbricately arranged bracts; pedicel short, 1-3 mm long, deep blue, puberulous. Bract 1, basal, ligulate, c. 3 × 1 mm, acute at apex, entire at margin, sparsely puberulous. Ebracteolate. Calyx cupular-campanulate, 4-6 × 3-4 mm, purple; lobes 5, oblong-lanceolate, each lobe c. 5.0 × 1.5 mm, connate basally, up to 2 mm, free part 3 mm, shortly acuminate at apex, obscurely ciliate at margin, densely puberulous inside, sparsely outside. Corolla infundibuliform, deep blue-mauve, 12-16 mm long, c. 8 mm wide towards apex, tube distinctly cylindrical, 6-10 mm long; lobes 5, ovate-obcordate, c. 6 × 5 mm, emarginated or notched at apex, ciliate at margin, distinctly veined. Stamens 5, epipetalous, c. 1.5 mm long; filaments minute up to 0.5 mm long, grayish-white; anther lobes 2, oblong, light brown, c. 1 mm long, shortly apiculate at apex, dorsifixed. Pistil c. 3.5 mm long; ovary obovoid-globose, 1.5-2.5 × 1.5 mm, glabrous, 5-locular, syncarpous; numerous minute ovules on axile placenta in each locule; style filiform, c. 1.5 mm long, glabrous; stigma capitate to truncate. Fruit loculicidal 5-valved capsule, c. 9 × 3 mm including pedicel, glabrous, with persistent calyx; capsule obovoid-globose, c. 5 × 3 mm. Seeds obconical, minute up to 0.5 mm long, scarious.

**Distribution:** INDIA: Eastern Himalayas (Sikkim: West and North districts); Nepal; Bhutan and China (Se Xizang).

**Habitat:** This species grows discontinuously in patches along moist and humus-covered rocky slopes in association with *Gaultheria hookeri*, *Rhododendron thomsonii*, *R. niveum*, *R. barbatum* and *Vaccinium mummularia* at altitudes ranging from 3,000-3,300 m.

**Flowering and Fruiting:** Late September to late October.

**Specimens examined:** INDIA: Sikkim: north district, about 10 km from Lachung towards Yumthang, c. 3,200 m, 04.x.2007, S. Panda 30792 (fl. & fr, CAL, Barasat Govt. College Herbarium); North district, between Lachung and Yumthang, c. 3,400 m, 04.x.2007, S. Panda 30799 (fl. & fr., Barasat Govt. College Herbarium); West district: Dzongri ('Jongri'), c. 4,000 m, June, 1887, King's Collector s.n. (Acc. no. 272263, CAL); Dzongri ('Jongri'), c. 4,500 m, 08.x.1862,

Anderson 830 (CAL).

**Field notes:** Craspedodromous leaf venation, up to 37 cm long scape; perulate head in umbel (3-5 × 3.5-5.5 cm) beset with white dust-like grains throughout; 15-18 mm long flowers; short puberulous deep blue pedicel up to 3 mm long; puberulous bract and calyx lobes; 12-16 mm long corolla; short stamens (c. 1.5 mm long) and styles (c. 1.5 mm long) and loculicidal 5-valved obovoid-globose capsule (c. 9 × 3 mm) not reported earlier.

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#### REFERENCES

- BALFER, I.B. & W.W. SMITH (1916): New Species of *Primula*. *Notes from the Royal Botanic Garden Edinburgh* 9: 160.
- BASAK, S.K. (2001): Study on the genus *Primula* L. (Primulaceae Vent.). Vol. 1: 408-410. University of Kalyani, Nadia, West Bengal (India).
- GOULD (1982): An Enumeration of the Flowering Plants of Nepal 3: 72. *In: Hara, H., A.O. Charter & L.H.J. Williams (Eds): Trustees of British Museum (Natural History), London.*
- HU, CHI-MING & S. KELSO (1996): Flora of China. Pp. 180. *In: Wu Zheng-yi & P.H. Raven (Eds): Primulaceae, Vol. 15. Publ. Science Press, Beijing and Missouri Botanical Garden, St. Louis.*
- MABBERLEY, D.J. (2008): *Primula*. *Mabberley's Plant Book: A portable dictionary of plants, their classification and uses. Ed. 3: 698.* Cambridge University Press, Cambridge, England.
- PAX, F. (1905): *In: Engler, A. (Ed.): Pflanzenreich* 4. 237 (Heft 22): 92.
- POLUNIN, O. & A. STANTON (1984): *Flowers of the Himalaya (Primulaceae).* Oxford University Press, Oxford. Pp. 243
- RICHARDS, J. (1993): *Primula*: 260. Timber Press, Portland, Oregon.
- SMITH, W.W. & H.R. FLETCHER (1944): The genus *Primula*: Sections *Corusoides*, *Malvaceae*, *Pycnoioaba*, *Dryadifolia*, *Capitatae*. *Trans. Bot. Soc. Edinburgh* 34(1): 156.

#### 18. NEW ADDITIONS TO THE SEDGE FLORA OF ANDAMAN & NICOBAR ISLANDS

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During the inventory of floristic diversity of the Mahatma Gandhi Marine National Park (MGMNP) in South Andaman, two Cyperaceae members were collected from the swampy area and along sandy seashores. On critical examination, the specimens were identified to be *Eleocharis acutangula* (Roxb.) Schult. and *Pycneus stramineus* (Nees) C.B. Clarke. Scrutiny of literature revealed that these species were hitherto unrecorded from this archipelago and hence reported here as new additions to the sedge flora of Andaman & Nicobar Islands (Vasudeva Rao 1986; Mathew 1998). Of the two species, *E. acutangula* is widely distributed and *P. stramineus* is found to be distributed in the South-East Asian region. Brief descriptions, illustrations, phenology and notes on their distribution are provided.

*Eleocharis* R. Br.

*Eleocharis acutangula* (Roxb.) Schult. in R. & S. Mant. 2: 91. 1824; Ridley, Fl. Malay Peninsula 5: 151. 1925; Baker & Bakhuizen, Fl. Java 3: 461. 1968; Kern in Steenis (ed.), Fl. Malesiana Ser. I. 7: 525. 1974; Koyama in Dassanayke (ed.), Rev. Handb. Fl. Ceylon 5: 256. 1985; Simpson & Koyama in Santisuk & Larsen (eds.), Fl. Thailand 6(4): 285. 1998. *Scirpus acutangulus* Roxb. Fl. Ind. 1: 216. 1820. *Eleocharis fistulosa* Schult. in R. & S. Mant. 2: 89. 1824; C.B. Clarke in Hook. f., Fl. Brit. India 6: 626. 1893; Ridley, Fl. Malay Peninsula 5: 151. 1925. (Fig. 1)

Perennial herbs, stoloniferous. Culms tufted, 40-60 cm long, triquetrous; sheaths 3-8 cm long, pale brown. Spikelet terminal, cylindrical, 2-5 cm long, pale green-yellow.